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Digital Games, Songs and Flashcards and their Effects on Vocabulary Knowledge of Iranian Preschoolers

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ABSTRACT

The study aimed to investigate (a) the effect of digital games, songs, and flashcards on vocabulary knowledge of Iranian EFL preschool learners and (b) the young learners' performance on mid-course tests of vocabulary with different topics. The participants included 350 preschool female learners in Oshnaviyeh, a town in Western Azarbaijan Province and were divided into three tablet, song, and traditional groups. Pre and post-tests of vocabulary and four mid-course tests based, on the learnt vocabularies, were administered during the research. The materials also consisted of a digital game, 16 songs, a structured student book, a workbook, and 60 flashcards. The analysis of the data revealed that there was no significant difference in the vocabulary knowledge of preschool learners who learnt vocabularies via games, songs, and flashcards. The results also showed that there was a significant difference in the three groups' mid-course tests with different topics. The findings recommend that using different techniques in the classroom considering learners' interest and needs can improve vocabulary knowledge of young learners.

Keywords: *Vocabulary Learning, Digital Games, Songs, Flashcards, Iranian Preschoolers*

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1. Introduction

One of the most noticeable achievements of early childhood is language learning (Hoff, 2009). Due to the fact that the highest rate of vocabulary development occurs during the preschool years (Farkas & Beron, 2004), early ages provide us with an opportunity to intervene. Thus, increasing oral vocabulary development can predict growth in comprehension and later reading performance (Neuman & Wright, 2014).

A number of studies (e.g., Beck & Mckeown, 2007; Cunningham & Stanovich, 1997; Neuman & Wright, 2014; Pikulski & Templeton, 2004) have found that the size of a person's vocabulary and knowing how to use them accurately are strongly related to the extent that a person understands what he or she reads and communicates well in a foreign language. It has always been suggested that vocabulary might be learned better in context (e.g., Ellis, 1997; Groot, 2000). One of the techniques that provides context for learning vocabulary is appropriate digital games, which are more engaging and add fun to the classroom. As Gee (2003) stated, we think and understand best when we imagine a situation that prepares us for action. Games present a similar situation through simulation, providing us with the opportunity to think, understand, prepare, and execute action (Gee, 2003).

According to Ilter (2015), during the recent century, there is a growing interest in the need to use technology at an early age. A digital game is a form of entertainment and media use with learning possibilities, which is played on digital devices (Ilomaki & Kankaanranta, 2009). Ilter also argues that using technology in different social and cultural contexts can

improve children's language and cultural awareness. In addition to giving fun (Pomerantz & Bell, 2007), digital games can be a part of children's learning process (Chuang & Chen, 2007). Games can also provide a learner-centered environment and good opportunities for socialization when well organized and can awake the will to win and the competitive desire inside people (Uzun, 2009).

A number of Researchers (e.g., Griffiths, 2002; Haugland, 2000; Liu, Cheng, & Huang, 2011; Sánchez & Olivares, 2011) have shown that games can also enhance learners' problem solving skills and increase players' self-esteem and self-confidence. Games can also promote genuine collaboration between users (Sánchez & Olivares, 2011).

Another technique for improving vocabulary is learning vocabulary through songs, which is supported by integrating complex interactive roles which can create a positive context resulting in high level of learner achievement (Boothe & West, 2015). Using songs to teach vocabulary to young learners can effectively improve learners' vocabulary and English knowledge (Burhayani, 2013). While some researchers (e.g., Abidin, Pour-Mohammadi, Singh, Azman, & Souriyavongsa, 2011; Keskin, 2011; Millington, 2011; Rusmiati & Dewi, 2016; Yamami, 2016) have addressed the vocabulary learning through songs, some others (Azabdaftari & Mozaheb, 2012; Basoglu & Akdemir, 2010; Falk, Band, & McLaughlin, 2003; Nakata, 2008; Printz, McLaughlin, & Band, 2006) have investigated learning vocabulary through flashcards. Other researchers (e.g., Aghlara & Hadidi Tamjid, 2011; Aslanabadi & Rasouli, 2013; Derakhshan & Khatir, 2015; Lui, 2015; Shahriarpour & Kafi, 2014; Turgut & Irgin, 2009; Young & Wang, 2014) have also studied vocabulary learning through digital games. In other words, most studies have been conducted to investigate the impact of learning vocabulary through digital games, songs, and flashcards on teenagers and adults and very few have focused on young or preschool learners' vocabulary development. Thus, the purpose of this study was to investigate the effects of digital games, songs, and flashcards on Iranian preschool students' vocabulary learning. To this end, the following research questions were formulated in this research:

Is there any statistically significant difference in learning vocabulary through digital games, songs, and flashcards by EFL preschool learners?

2. Is there any statistically significant difference in the young learners' performance on mid-course tests of vocabulary with different topics?

2. Review of the Related Literature

2.1. Vocabulary Knowledge

According to Oxford and Crookall (1990), vocabulary knowledge is the knowledge of knowing second language words in a way that the learner not only has the ability to recognize the vocabulary or to connect it with its counterpart, but he/she is also able to use that word in all four main language skills. Nation (2013) states that vocabulary knowledge is divided into three parts: knowledge of form, meaning, and use. Shen (2009) suggests at least two dimensions for vocabulary knowledge, which are vocabulary breadth and depth or quality of vocabulary knowledge. According to Shen, vocabulary breadth is "the number of words about the meaning of which a learner has at least some superficial knowledge" (p. 136), and depth of vocabulary knowledge is "a learners' level of knowledge of various aspects of a given word, or how well the learner knows this word" (p. 136).

Vocabulary links four skills of language (i.e., speaking, listening, reading, and writing) all together (Tuan, 2011). Many researchers (e.g., Nation, 2001; Richards & Renandya, 2002; Schmitt, 2010) have argued that by learning vocabulary and understanding its relationship with language skills, learners can apply these four skills appropriately. On the other hand, gaining knowledge of vocabulary is a crucial challenge for learning a foreign language; most beginners seem to experience similar problems in studying vocabularies in terms of large burden and the lack of motivation (Jung & Graf, 2008).

2.2. Methods of Learning Vocabulary

According to Hunt and Beglar (2002), there are three methods to vocabulary learning: incidental vocabulary learning, explicit instruction, and independent method development. Nation (2001) defines incidental vocabulary learning as expanding someone's vocabulary knowledge by being involved in language activity without focusing intentionally on vocabulary. Nation (1990) also defines

explicit strategy as direct vocabulary learning; that is, instructing learner's focus by using tools such as dictionary use, vocabulary list, vocabulary explanation, etc. on activities in which they learn vocabularies without delay. Nunan (as cited in Tuan, 2011) states that independent strategy development is a method in which learners are trained to guess and understand vocabularies from context. They are also trained to use dictionary and other clues available in the context such as affixes, roots, pictures, diagrams, etc. to indicate the meaning.

2.3. Digital Games

Today's children that Prensky (2003) refers to as "digital natives" are growing up with laptops, cell phones, tablets, and video calls and are using this new technology in their daily interactions (Burkhardt, et al., 2003). Technology improvement in recent years has changed the essence and nature of games and has introduced a new generation of games to the world: digital Games. Gee (2012) defines a digital game as a well-designed experience, which is based on play and involves problem-solving activities bringing about motivation, engagement, and creativity. Shahriar Pour and Kafi (2014) also state that using digital games makes students active participants of the 21st century technological society. During playing digital games, children experiment and explore complex worlds offered by digital games in which they playfully fail and succeed (Takeuchi & Vaala, 2014).

2.3.1. Digital Game-Based Learning

Playing game can bring fun and creativity into the classroom (Pomerantz & Bell, 2007). These elements are essential, especially for language learning classes where learners get bored very quickly and lose their concentration during long period of learning a foreign or second language. Language learning games or reproductions with specific linguistic or cultural objects can be successful, especially when learners who are motivated by outside component use these games in proper context (Godwin-Jones, 2014); therefore, the combination of playing and learning through digital games and other computer technologies in learning environments has been named "digital game-based learning" (Prensky, 2001). Tang, Hanneghan, and El Rhalibi (2009) argue that digital game-based learning "takes advantages of gaming technologies to create a fun, motivating, and interactive virtual learning environment that promotes situated experiential learning" (p. 1).

Due to the emergence of mobile devices and increasing learners' access to technology everywhere and every time, Prensky points out that these learners "think and process information fundamentally differently than their predecessors" (p. 2). Thus, their teachers or "digital immigrants", as Prensky calls them, have to meet their technological need and adapt their instructions to the new learning styles of today's students.

Digital games provide a competitive learning environment in which learners cooperate with each other and can work together (Derakhshan & Davoodi Khatir, 2015); thus, it provides a context (Gee, 2007) for them to speak and use new foreign or second language vocabularies. Huyen and Nga (2003) contend that vocabulary games provide an opportunity for learners' use of target language in a flexible and communicative way by converting language class to a real world context.

Kalaycioglu (2011) also contends that digital games are learner-centered, so they can be adjusted in line with the educational objectives and also the age and level of the children. Digital games can provide a multimedia context in which children are engaged in vocabulary, key sentences, and short conversation repetitions; therefore, they interact with each other and as a result, the acquisition of language vocabulary is encouraged (Segal-Drori, O., Korat, Shamir, & Klein, 2010).

2.3.2. Advantages of Digital Games

Positive effects of games on learning, especially on young children have been pointed out by many researchers (e.g., Gee, 2012; Leemkuil, 2006; Prensky, 2003; Tüzün, Yılmaz-Soylu, Karakuş, İnal, & Kızılkaya, 2009; Van Eck, 2006). If digital games are used properly, they are acknowledged to have several educational advantages (Prensky, 2001, 2002; Tsai, Yu, & Hsiao, 2011). According to Reinders and Wattana (2014), digital games provide engaging context; therefore, they enhance learning engagement that have recently been explored for their educational potentials. Digital game-based learning can maintain the motivation for learning better (Tuzun, et al., 2009). Tsai, Yu, and Hsiao (2011) also asserted that digital game-based learning enables

players' verbal exchange capabilities and social interaction skills with different players all over the world.

Researchers (e.g., Bagheri, Roohani, & Ansari, 2012; Gee, 2003; Hirschel & Fritz, 2013) have also identified computer games as an appropriate computer application that produces motivation in its users. Technology provides young language learners with an opportunity to learn language skills outside the classroom when they interact actively (Gee, 2005; Wang, Khoo, Liu, & Divaharan, 2008). As Ilter (2015) points out, children can improve their language and cultural awareness by using technology in different social and cultural contexts, and language awareness can be faster through intercultural communication; in fact, technology gives unlimited resources.

According to Haugland (2000), the suitable use of computers and implementing educational software may increase creativity and self-esteem in children. Haugland also contends that children's intelligence, verbal and non-verbal skills, visual and movement-related abilities, structural knowledge, long-term memory, problem-solving and decision-making abilities, abstraction and conceptual formation skills may be effectively increased when children are exposed to software.

2.3.3. Disadvantages of Digital Games

Some researchers (e.g., Anderson & Bushman, 2001; Carnagey, Anderson, & Bushman, 2007; Dawson, Cragg, Taylor, & Toombs, 2007; Hauge & Gentile, 2003; Subrahmanyam, Kraut, Greenfield, & Gross, 2000) have pointed out the negative aspects of using digital games. According to Gros (2007), digital games provide a simplified example of the reality, and most of them are based on violent and misogynistic background, so when children play these games, they show violent behavioral patterns (Gunawardhana & Palaniappan, 2015). Gunawardhana and Palaniappan (2015) also argue that playing digital games continuously can cause physical disadvantages such as Nintendo thumb, epileptic seizures, and joint, muscles, and skin problems. It can also produce addictive behavior in children; therefore, it can have negative effects on academic performance when playing the game for a long period of time (Hauge & Gentile, 2003).

2.4. Songs

As Lo and Li (1998) stated, songs are one of the pedagogical materials that offer a break from classroom and educational ordinary tasks and serve as a textbook, which develop the four language skills. Songs have also become an important part of human's language experience (Abidin, Pour-Mohammadi, Singh, Azman, & Souriyavongsa, 2011). Incorporating music and songs into the classroom has been shown to have positive effects on learning by many researchers (e.g., Fonseca-Mora, Toscano-Fuentes, & Wermke, 2011; Griffee, 1992; Lo & Li, 1998; Murphey, 1992; Siskova, 2008). According to Fonseca-Mora et al. (2011), songs "increase sensibility, aid memory, improve concentration, help develop reading and writing abilities, favour physical development and give rise to enjoyment when learning" (p. 104).

According to Boothe and West (2015), music lyrics and songs serve as educational tools that strengthen and enhance vocabulary comprehension, listening, speaking and writing. Songs can also develop learning through auditory skills and rhythmic patterns that stimulate brain tasks and encourage creativity. Johnston (2002) noted that many teachers use songs for their effectiveness in learning. According to Demiral (2004), teaching listening comprehension, pronunciation, and dictation to children via songs is a very effective technique. Cameron (2001) asserted that using songs for foreign language learning is crucial to young learners. Mejzini (2016) stated that songs are one of the useful and effective techniques of learning a foreign language because interesting activities help children learn better, and learning through songs is an interesting activity for children.

According to Fonseca-Mora et al. (2011), teachers have used songs, music and rhythm over the years to help language learning. Since the songs seem to have the capability to affect our feelings and emotions, and also due to the fact that most children like to listen to songs in their free time, songs can be used as an effective technique for vocabulary learning (Batista, 2010), which reduce anxiety, produce high motivation and also have the ability to communicate ideas and feeling (Young, 1991). Siskova (2008) stated that one of the essential elements for recording and storing information in long term memory is revision, which can be obtained through

using learners' preferred songs for learning vocabularies.

Using songs in learning a foreign language motivates learners, brings fun and pleasure to the classroom and makes the classroom a relaxed and interesting environment (Mejzini, 2016). Ara (2009) argued that children can study a language better in natural learning context because natural activities do not cause them to be aware that they are learning a language. Ara also states that music creates motivation, interest, and enjoyment; thus, children imitate and remember language vocabularies easier.

2.5. Flashcards

Azabdaftari and Mozaheb (2012) define flashcards as "a cardboard consisting of a word, a sentence, or a simple picture on it" (p. 4). Many researchers (e.g., Heron, Heward, Cooke, & Hill, 1983; Houten & Rolider, 1989; Maheady & Sainato, 1985; Olenick & Pear, 1980; Young, Hecimovic, & Salzberg, 1983) have considered the flashcards as an easy and effective technique for teaching discrete skills such as sounds, letter name, important dates in the history, new vocabularies, and expressions to students.

Using flashcards for teaching and learning has various advantages; for example, Young, Hecimovic, and Salzberg (1983) considered flashcards as a useful tool for teaching sounds of the alphabet. Ervin (1988) pointed out that students can use flashcards for completion drills and practicing foreign language vocabulary expansion. Furthermore, teachers can use flashcards for teaching vocabularies, propositions, articles, sentence structure, tense, and phrasal verbs (Palka, 1988). Tan and Nicholson (1997) stated that flashcards are useful tools for developing comprehension and improving reading speed, too. According to Stutz (1992), flashcards are considered as useful teaching techniques at all language levels.

Using flashcards is a useful tool and an effective technique for vocabulary learning. Nicholson (1998) argued that by using flashcards learners can build the knowledge of high frequency words. Researchers (e.g., Mondria & Mondria-de Vries, 1994; Schmitt & schmitt, 1995) contended that flashcards are more effective in learning vocabularies than other techniques such as word lists. Moreover, flashcards are one of the most accepted and widely used techniques by many learners for vocabulary learning and vocabulary self-testing (Oxford & Crookall, 1990).

2.6. Empirical Studies

Aghlara and Hadidi Tamjid (2011) investigated the effects of using digital computer games on improving Iranian children's vocabulary learning. They conducted their research with six to seven years old female learners (N=40) divided into experimental and control groups. In the experimental group, they used SHAIEx digital game, whereas in the control group, language was taught through traditional methods. At the end of the teaching period, researchers compared the results of the test. The outcome of the research revealed that the mean score of the learners in the experimental group was better than that of the control group. They concluded that using digital games in teaching English vocabularies to children could have positive effects.

Nugroho, Nurkamto, and Sulistyowati (2012) conducted a classroom action research to improve students' vocabulary mastery and motivation in using flashcards. The research was carried out through two cycles of action. In each cycle, the procedure of the research consisted of planning, acting, observing, and reflecting. The researchers collected the data by qualitative and quantitative methods. They used interview, observation, document analysis, and test for collecting qualitative data. The quantitative data were analyzed by finding and comparing the mean scores in the pretest and posttest. Using flashcards made students active and enthusiastic in joining learning activity. The results showed an improvement in the students' achievement. They also concluded that teaching English vocabulary by using flashcards improved the students' vocabulary mastery.

Aslanabadi and Rasouli (2013) carried out a study about the effects of digital games on the development of foreign language vocabulary in the Iranian kindergartens. They intended to find a method to help young learners retain learnt words in their minds. In this research, kindergarten learners were divided into experimental and control groups. Experimental group was taught by an online language teaching game, while in the control group normal teaching method was used. At the end, it was revealed that using language games for teaching

vocabulary not only provided fun for children, but also it motivated children and enhanced their confidence.

Diakou (2013) examined the role of songs in learning a foreign language with Cypriot learners of 9-12. She also investigated the role of songs in creating positive emotions in the primary language classroom and examining the effects of these positive emotions on improving learnt grammatical structure and vocabulary acquisition. Diakou used an ethnographic case study framework through quantitative and qualitative methods to do the research. The participants were about 320 fourth to sixth grade pupils with mixed ability whose instruction was through using the songs with different educational tasks of the classroom. The data were collected through observation and questionnaire. A follow-up focus group discussion with a smaller group was done to provide the participants with an environment to express their ideas freely. The findings of the study revealed significant improvement in the language learning after using songs in the classroom.

Mazaji (2015) investigated the effect of digital games on vocabulary acquisition of low proficiency Iranian male and female EFL learners. Nelson Proficiency test was administered to select 60 homogeneous low-proficiency learners; the participants were randomly divided into four groups: female experimental group, male experimental group, male control group, and female control group. First a pretest was administered to determine the learners' level of vocabulary knowledge. Then the Polyglot and the Speedy games were played in the experimental groups, while in the control groups participants attended their regular classes without playing these games. After that, a posttest was administered. The research findings confirmed the positive effects of playing digital games in classes on vocabulary learning for all participants in favor of male learners.

In another study Dzanic and pejic (2016) investigated the effect of audio and/or video songs on learning vocabulary items of young learners. They carried out the study among 28 second grade primary students. The participants were divided into experimental and control groups. The data were obtained from a pre-test, a post-test, and a delayed test as well as a motivation questionnaire. The finding of this study revealed positive effects of the songs on learning vocabulary. The results also proved that songs could motivate learners to learn in a lovely context.

Jafarian and Shoari (2017) studied the effect of game on learning vocabulary among Iranian young EFL learners. They carried out their research among 60 male elementary level learners divided into experimental and control groups. A pretest and a posttest were used in both groups to collect the data. The results proved the effectiveness of game in learning the vocabulary items. In the current study the effects of digital games, songs and flashcards on vocabulary knowledge of EFL Iranian preschool learners were investigated.

3. Methodology

3.1. Participants

The population of this research was 350 preschool female learners in Oshnaviyeh, a town in Western Azarbaijan Province. The learners were studying in Andisheh and Ghazal private preschool centers in summer in 2016. From among these 350 female learners, 150 learners were studying in Ghazal preschool center in which 90 learners were five years old, whereas 60 ones were six years old. The rest of the learners were students in Andisheh preschool center that 120 learners were five years old, while 80 ones were six years old.

The participants in this research were selected according to the stratified random sampling. In this type of sampling, "the proportions of the subgroups in the population were first determined, and then participants were randomly selected from within each stratum according to the established population" (Macky & Gass, 2005, p. 120). With regard to the number of learners in both Ghazal and Andisheh preschool centers, and also concerning the age proportion of the learners in both preschool centers, 60 learners were selected as the research sample.

Since the age of the learners was from five to six years old, the researchers selected the research sample based on their age proportion in the population. Three fifth of the selected sample from Ghazal preschool center equaling to 16 participants (59.26%) were selected from among five year old learners. Similarly, two fifth of them equaling to 11 participants (40.74%) were six years old. From among the 33 selected participants of the Andisheh preschool center, three fifth

of them equaling 20 participants (60.60%) were five years, while two fifth of them equaling 13 participants (39.40%) were six years old. The sample was divided into three groups equally: tablet, song, and traditional groups. It should be noted that none of the participants had attended English learning classes prior to this research; thus, it was not necessary to utilize any language proficiency test to ascertain the homogeneity of the participants of this study.

3.2. Instruments and Materials

Six instruments (i.e., pre-test, post-test, and four mid-tests) were prepared by the researchers. The tests were vocabulary tests that were prepared based on the vocabularies that students studied during the process of the experiment. The tests contained two kinds of oral question to assess the vocabulary knowledge of the participants. For the first type of question in each test, the researchers showed a flashcard to the learner and asked her to name the associated word orally. Regarding the second type of questions which was a point-to-test, the researchers read the words, and the learner was needed to point to the right associated picture on a related poster. The number of questions in each part of the pretest and posttest was 20; therefore, the total number of questions in the pretest and posttest was 40. But in the mid-course tests, in each section of the materials only 15 words were taught, and the mid-course test utilized after each section was completed and finished; therefore, the number of questions in each part of the tests was 15. As a result, the total number of items in mid-course tests was 30.

The other point was that the pretest was administered to evaluate learners' real level of vocabulary knowledge before taking part in the experiment. In posttest, participants took the same test to evaluate and measure the amount of their grasp of vocabulary after the implementation of the experiment. In order to prevent the test practice effect, the arrangement of the test items in the pretest and posttest was different from each other.

In order to conduct the present study, the researchers used different materials for the three groups involved in the experiment. For the first experimental group, tablet group, whose teaching method was through playing digital games on the tablet, digital game software, Bud's First Words, was installed on each student's tablet. The game contained two main stages: Learn and Play. Each main stage consisted of 24 sub stages. The game contained graphical, audible, and touchable icons. The game was available free online on the Google play store (https://play.google.com/store/apps/details?id=com.nimbleminds.everydaywordsfree)

For the second experimental group, song group, 16 songs were employed to teach new vocabularies to participants. The songs were multimedia containing both audio and video features. Some of the songs were available in the market, and some were available free online. Each four songs were about one subject: bedroom, bathroom, breakfast, and classroom. Therefore, in all groups the researchers taught the same vocabularies to all participants. For the last group, who is called by the researchers 'traditional group', the researchers applied audio-lingual method, course book, work book, and flashcards for teaching vocabularies. These books were prepared by the researchers.

3.3. Procedure

After the coordination of the researchers with the principals and educational personnel of two private preschool centers, the research was begun. At the first step, researchers selected 350 learners of Ghazal and Andisheh preschool centers as the research population. Then they selected 60 of them as the research sample with stratified sampling method. The second step was dividing participants into three groups. The researchers named these groups as tablet group, song group, and traditional (Flashcard) group.

One of the researchers was the instructor in all three groups; therefore, at the first session for each group, the instructor gave the participants a pretest including 40 vocabulary pictorial items, which was carried out individually in order to ensure their equality in terms of vocabulary knowledge at the beginning of the experiment. Four subjects were to be taught during the research containing 60 new vocabularies; thus, in each three sessions, the instructor taught one subject or 15 vocabularies to participants. In the fourth session, a mid-course test was given to the participants.

For teaching new vocabularies, during a 40 day teaching period with three 75-minute sessions during a week, the

instructor taught the learners in the tablet group English vocabularies by playing a digital game. Isn the first session the instructor installed digital game software on the participants' tablets and made them familiar with the game of Breakfast sub stage. Each vocabulary was repeated aloud by touching the question mark on items in that picture. In each 'Learn' sub stage of the game, participants learned 15 new vocabularies of that environment, and then item's full picture was displayed. In the two next sessions they reviewed those vocabularies and evaluated themselves by playing the corresponding Play sub stage of the game.

For song group, the duration of the teaching period was the same as that of tablet group. In song group the classroom was equipped with the intelligent equipment, too; thus, the instructor displayed each song on the board. Participants were taught English vocabularies by listening to the songs about those vocabularies and repeating them, while the songs' video was displaying on the board, and the learners were watching song's video on the board. The researchers provided four songs for each subject. It should be noted that the educational subjects were exactly the same in all three groups. Similarly, in this group after learning four songs for each subject a mid-course test was given to the participants by the instructor indicating their progress.

Similarly, for the traditional group, the educational topics, vocabularies, and the instruction duration were the same, the only difference was the teaching method. In the traditional group, the instructor taught vocabularies by audio-lingual method. Students used course book, work book, and flashcards that all were prepared by the researchers. Two experts of TEFL confirmed their validity. The course book consisted of four units, the same as ones in digital game. They were Breakfast, Bathroom, Bedroom, and Classroom. In fact it was a printed copy of the same game. In each unit 15 words of that subject were taught through audio-lingual method. The work book consisted of some work sheets of the units available in the course book. Like other two groups, three sessions were related to teaching new vocabularies of a subject, for example Breakfast, and practicing corresponding worksheets in the workbook. The fourth session was for utilizing a mid-course test.

Finally in the last step, the posttest was given to participants individually to find out the effect of using digital games, songs and flashcards on learning English vocabularies by female preschool learners and to compare the result of each group with others. In this research, for each correct answer the participants received one point, and for each wrong answer, they received a zero point. To ensure the content validity of the tests, all six tests were sent to five experts of TEFL and the two supervisors of the present research. They reviewed the tests and confirmed the content validity of the tests.

3.4. Data Analysis

The Analysis of Covariance (ANCOVA) was run to take into account the initial differences on the pretest as covariate and then compare the final results of the three groups in the posttest. At the end, the descriptive statistics of the three groups in terms of each mid test mean were computed. Then, one-way ANOVA was run, comparing the three groups in terms of each mid test mean.

4. Results

4.1. Comparing the Digital Games, Song, and Flashcard Groups on the Vocabulary Tests

Initially the descriptive statistics of the three groups on the pretest and posttest were computed. The results are presented in Table 1 and Figure 1

Table 1: Descriptive Statistics of Tablet, Song, & Traditional Groups on the Pre and Posttests of Vocabulary

Group		N	Min	Max	Mean	SD	Skewness		Kurtosis	
Tablet	Pretest	16	.00	3.00	.75	1.00	1.029	.564	-.141	1.091
	Posttest	16	12.00	37.00	29.62	7.13	1.127	.564	.908	1.091
Song	Pretest	15	.00	3.00	.73	.96	1.152	.580	.593	1.121
	Posttest	15	12.00	38.00	25.33	8.49	-.088	.580	-1.110	1.121
Traditional	Pretest	15	.00	2.00	.53	.74	1.074	.580	-.106	1.121
	Posttest	15	11.00	40.00	24.60	9.24	.243	.580	-1.209	1.121

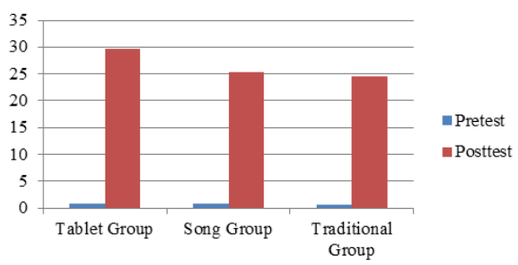

Figure 1: Tablet, Song, & Traditional Groups' Pretest and Posttest Means

As Table 1 and Figure 1 show, all the three groups showed some improvement in their vocabulary mean from pretest to

posttest. In order to determine whether these improvements in the groups are statistically significant, paired-samples *t* test was run for each group. It should be noted that paired-samples *t* test is a parametric test requiring normality of the data; therefore, the skewness and kurtosis values in Table 1 were divided by their relevant standard error to compute the skewness and kurtosis ratios. Since all these ratios were within -+1.96, the data were considered normal, hence allowing running paired samples *t* test as a parametric test.

Table 2: Paired Samples Test

Group			*Mean*	*SD*	*t*	*df*	*p*	Effect Size
Tablet	Pair1	Pretest - Posttest	-28.87	6.87	-16.791	15	.000	-6.087
Song	Pair1	Pretest - Posttest	-24.60	8.66	-10.993	14	.000	-3.47
Traditional	Pair1	Pretest - Posttest	-24.06	9.53	-9.775	14	.000	-2.92

Table 2 presents the paired samples t test results for each group showing that all the groups showed significant improvement in their vocabulary means from pretest to posttest ($p < .01$, large effect sizes). Despite the fact that the above t test results showed significant improvement in the vocabulary means of all groups from the pretest to posttest, it is not clear which group showed more improvement from the pretest to posttest. Therefore, in order to examine which group showed more significant increase from the pretest to the posttest in vocabulary mean, it was necessary to compare the posttest means of the groups with one another. However, since the three groups showed some initial mean differences on the pretest, it was necessary to run Analysis of Covariance (ANCOVA) to take into account the initial differences on the pretest as covariate and then compare the posttests.

One of the assumptions of ANCOVA is normality of the data which was already checked by computing skewness and kurtosis ratios from Table 1. Another assumption of ANCOVA is homogeneity of variances which was checked by running the Levene's test whose results in Table 3 indicate that the difference is not significant ($p > .05$), hence meeting the assumption of homogeneity of variances.

Table 3: Levene's Test of Equality of Error Variances[a] (Dependent Variable: Posttest)

F	*df1*	*df2*	*p*
.798	2	43	.457

Table 4 demonstrates the results of the check on the assumption of homogeneity of regression slopes and the main ANCOVA results. The third row indicates that the assumption of homogeneity of regression slopes is met ($p > .05$). The fourth row of Table 4 also shows that the groups were not different on the pretest ($p > .05$), and finally the fifth row demonstrates that the groups are not significantly different on the posttest; Group $F(3,42) = 1.661$, $p > .05$.

Table 4: Tests of Between-Subjects Effects (ANCOVA results; Dependent Variable: Posttest)

Source	Type III Sum of Squares	*df*	Mean Square	*F*	*p*	Partial Eta Squared
Corrected Model	235.938[a]	3	78.64	1.114	.354	.074
Intercept	20834.606	1	20834.60	295.106	.000	.875
Group * Pretest	244.922	2	122.46	1.801	.178	
Pretest	5.469	1	5.46	.077	.782	.002
Group	234.504	2	117.25	1.661	.202	.073
Error	2965.214	42	70.600			
Total	35717.000	46				
Corrected Total	3201.152	45				

a. R Squared = .074 (Adjusted R Squared = .008)

As shown in Table 4, there was no statistically significant difference in preschool learners' vocabulary knowledge that learnt vocabularies via digital games, songs, and postcards. However, it should be noted that these results were achieved based on sample sizes which were very small (i.e., 15 & 16), which make hypothesis testing very strict. Therefore, it was decided to compare the effect sizes of the pretest-posttest comparison of each group based on the paired samples *t* test in Table 2. Obviously, all the effect sizes were too large (i.e. above 1). However, in comparison, the tablet group was of the highest effect size (i.e. -6.087), and the traditional group was of the lowest effect size (i.e. -2.92). Given this point, it is very probable that replicating this study with larger sample size may result in finding positive effect for tablet or song treatment on vocabulary learning.

4.2. Comparing Three Groups' Performance on Mid-Course Tests of Vocabulary

In this section, the three groups are compared with each other in terms of each mid-course test. In so doing, initially the descriptive statistics of the three groups in terms of each mid-course test mean were

computed. The results are presented in Table 5.

Table 5: Descriptive Statistics of the Three Groups' Mid-Course Tests

		N	Mean	SD	Std. Error	Min	Max
Test1. Bedroom	Tablet	16	23.25	4.640	1.16	15.00	30.00
	Song	15	18.46	7.65	1.97	5.00	30.00
	Traditional	15	17.33	7.55	1.95	8.00	30.00
	Total	46	19.76	7.07	1.04	5.00	30.00
Test2. Bathroom	Tablet	16	21.00	5.32	1.33	8.00	29.00
	Song	13	14.61	7.51	2.08	4.00	28.00
	Traditional	15	15.13	7.86	2.03	4.00	26.00
	Total	44	17.11	7.39	1.11	4.00	29.00
Test3. Breakfast	Tablet	16	20.37	7.31	1.82	.00	28.00
	Song	15	14.66	6.75	1.74	3.00	24.00
	Traditional	15	15.60	9.49	2.45	.00	29.00
	Total	46	16.95	8.15	1.20	.00	29.00
Test4. Classroom	Tablet	16	19.68	7.22	1.80	.00	28.00
	Song	15	14.00	5.09	1.31	6.00	27.00
	Traditional	15	15.73	8.38	2.16	.00	30.00
	Total	46	16.54	7.29	1.07	.00	30.00

As Table 5 shows, the highest mean was obtained by Tablet group on all mid-course tests with different topics, whereas with regard to classroom, breakfast, and bathroom topics the lowest mean was obtained by song group. Learners in the traditional group only received the lowest mean on the mid-course test with the bedroom topic. One-way ANOVA was run, comparing the three groups in terms of each mid-course test mean. One of the assumptions of one-way ANOVA is homogeneity of variances whose result is presented in Table 6.

Table 6: Test of Homogeneity of Variances

	Levene Statistic	df1	df2	p
Test1.Bedroom	4.011	2	43	.065
Test2.Bathroom	1.916	2	41	.160
Test3.Breakfast	1.213	2	43	.307
Test4.Classroom	1.782	2	43	.181

The result of the Levene's test showed that the difference was not significant ($p > .05$), indicating the meeting of the assumption of homogeneity of variances was met. The result of ANOVA test is presented in Table 7.

Table 7: ANOVA

		Sum of Squares	df	Mean Square	F	p
Test1.Bedroom	Between Groups	308.303	2	154.151	3.413	.042
	Within Groups	1942.067	43	45.164		
	Total	2250.370	45			
Test2.Bathroom	Between Groups	381.622	2	190.811	3.974	.026
	Within Groups	1968.810	41	48.020		
	Total	2350.432	43			
Test3.Breakfast	Between Groups	293.230	2	146.615	2.333	.109
	Within Groups	2702.683	43	62.853		
	Total	2995.913	45			
Test4.Classroom	Between Groups	265.042	2	132.521	2.672	.081
	Within Groups	2132.371	43	49.590		
	Total	2397.413	45			

The ANOVA results in Table 6 indicate that the three groups differed in their vocabulary mean in the mid-course tests 1 and 2 whose lexical items were about 'bedroom' and 'bathroom' topics ($p < .05$). In order to determine which groups specifically differed, post hoc pairwise comparisons were run, whose results are presented in Table 8

Table 8 : Multiple Comparisons

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	p	95% Confidence Interval	
						Lower Bound	Upper Bound
Test1.Bedroom	Tablet	Song	4.78	2.41	.054	-.0876	9.6543
		Traditional	5.91*	2.41	.018	1.0457	10.7876
	Traditional	Song	-1.13	2.45	.647	-6.0822	3.8155
Test2.Bathroom	Tablet	Song	6.38*	2.58	.018	1.1591	11.6101
		Traditional	5.86*	2.49	.023	.8370	10.8963
	Traditional	Song	.517	2.62	.845	-4.7851	5.8210

*. The mean difference is significant at the 0.05 level.

As shown in Table 8, in the mid-course test 1, the tablet group was of significantly higher mean than only the traditional group (p = .018); however, the song group is not of any significantly different mean from both tablet and traditional groups (p=.647). In the mid-course test 2, the tablet group was of significantly higher mean than both the song and the traditional groups (p < .05); however, the song group was not of any significantly different mean from traditional group (p=.845).

5. Discussion

The present study was set out to examine the impact of different techniques of learning vocabularies (i.e., digital games, songs, and flashcards) on developing foreign language vocabulary knowledge of preschool learners. The findings of this research revealed that since all three groups showed significant improvement in their vocabulary scores from pretest to posttest, it can be concluded that using different vocabulary teaching techniques in the preschool classes had positive effects on their English vocabulary knowledge. Young learners lose their concentration very quickly and get bored during the long hours of learning a foreign language. Therefore, teaching with an effective and interesting technique engages young learners and help them focus their attention on the learning process.

Alemi (2010) found out that students' vocabulary knowledge enhanced with learning vocabulary through playing the word game. Similarly, Aslanabadi and Rasouli (2013) addressed the effects of digital games on the development of

foreign language vocabulary in the Iranian kindergartens. They found that using language games for teaching vocabularies to children could motivate them and enhance their confidence. In another similar research, Aghlara and Hadidi Tamjid (2011) investigated the effects of using digital computer games on improving vocabulary learning. The findings of their research revealed that using digital games led to more positive effects on learning English vocabularies than the traditional methods. Mazaji (2015) conducted a similar research, but she considered the factor of gender, too. Her research findings confirmed the positive effects of playing digital games for all participants in favor of male learners.

The finding of the present research is in line with that of a research by Abidin et al. (2011), who found that proper use of songs in the vocabulary teaching classes could lead to improving vocabulary competence of the learners. In another study, Diakou (2013) investigated the role of songs in language learning, and reported significant improvement in language learning through songs in the classroom. But, the results of the study by Dehaan, Reed and Kuwado (2010) are in contrast with those of the present research. They examined the effect of interactivity with a music video game on recalling second language vocabulary and found out that interactivity with a music video game could make the progress of language acquisition slow. In addition, findings of the present study showed that English vocabulary knowledge of the learners improved by using flashcards, too. Findings of previous studies also support the positive effect of learning vocabularies through flashcards. In a study by Nugroho, Nurkamto, and suristyowati (2012), results showed that flashcards were effective media, which improved the students' vocabulary mastery. They also reported that using flashcards motivated learners to join learning tasks enthusiastically and actively.

Although the findings showed that there was a significant improvement in vocabulary score of all groups from pretest to posttest, the findings revealed that there was no statistically significant difference in the preschool learners' vocabulary knowledge via digital games, songs, and flashcards. It is argued that replicating the research with a large sample size may lead to more significant difference among the three groups. Another point is that the digital game used with tablet group in this research was very simple and was suitable for using in short-time interventions in preschools. It certainly lacks some elements that make the classroom context a competitive environment for learners. Given that a rather simple digital game had positive effects on learners' vocabulary knowledge and could reinforce their motivation to continue playing the game, it may be expected that a more sophisticated game would yield more positive results and more significant difference in the preschool learners' vocabulary knowledge. In a similar study, Baleghizadeh and Ashoori (2011) examined the impact of two techniques of vocabulary teaching (i.e., flashcards and word lists) on learners' vocabulary knowledge. Their research findings showed no significant difference in the effectiveness of either of the two techniques.

However, comparing the effect size of the pretest-posttest comparison of each group based on the paired sample *t* test indicated that the tablet group instructed by the digital games showed more improvement than the other two groups. However, the improvement of vocabulary knowledge in the song group was better than the traditional group whose instruction was by using flashcards. Basoglu and Akdemir (2010) conducted a similar study, investigating the effects of using vocabularies in mobile phones on students' English vocabulary compared with using flashcards. The findings of their research also indicated that both vocabulary learning program in the mobile phones and flashcards had positive effect on vocabulary learning and improved the vocabulary knowledge of the participants. However, the findings of their research showed that learning vocabulary on mobile phones was more effective and entertaining, leading to more significant improvement. This finding may be related to the number of the participants, which was 30, while the participants of the present research were 15 for each group. It may also be related to the difference between the digital game and the program used with each research groups.

Another finding of this research was that with regard to comparing the three groups' difference in the young learners' mid-course test with four different topics, the tablet group showed better results than

the other two groups. Moreover, there were significant differences among the four test sessions; that is, in the traditional group, the results of all four mid-course tests were similar, meaning that the effect of flashcards on different topics of vocabularies may be the same. Otherwise, the two tablet and song groups showed significant difference in their mid-course test results. Furthermore, these two groups showed a similar pattern of vocabulary knowledge improvement, which means both digital games and songs may have different effect on learning different topics on vocabularies. This finding may be related to the difference of the game stages and their various topics, the level of learners' familiarity with the topics of vocabularies, the frequency of using those vocabularies in learners' culture, and learners' interest in that specific topic, the stage of the game, and the song used for that topic.

6. Conclusions

This study aimed to investigate the effects of digital games, songs, and flashcards on foreign language vocabulary knowledge of Iranian preschool learners. In addition, the young learners' performance on mid-course tests of vocabulary with different topics was examined. Regarding the objectives and the research questions of this study, the following findings were determined: (a) there was a significant improvement in vocabulary knowledge of all participants from pretest to posttest; (b) there was not a statistically significant difference among learners' vocabulary knowledge in the three groups that learnt English vocabularies via digital games, songs, and flashcards; (c) learning vocabulary through digital games showed the highest effect size; and (d) there was a significant difference in the young learners' mid-course tests with different topics not only in each group separately, but also when comparing the three groups with each other.

Given the findings, it can be concluded that digital games, songs, and flashcards have positive effects on learning foreign language vocabularies in children, and these techniques can develop their English vocabulary knowledge. However, there is more need for empirical data related to the use and efficacy of different techniques of vocabulary learning for preschool learners.

Due to the preschool learners' interest in using digital games and songs, the finding of this research is useful for the writers of preschool books to compile new books and educational materials containing more songs to improve language skills of preschool learners. Using digital games, songs, and flashcards in the classroom provides equal opportunities for all students to engage in the classroom activities; especially the shy and weak students can participate and engage in activities equally. Using each of these techniques should also be based on the teaching materials, educational curriculum, the need and interest of the learners; thus, teachers can use one or a combination of these three techniques in teaching English language vocabularies. Considering the results of this research may also help teachers and test designers to assess and evaluate learners' vocabulary knowledge by using digital games and songs.

This study investigated the effect of digital games, songs, and flashcards on vocabulary knowledge of preschool learners; another research can be investigated on the effects of these techniques on the learning of other skills and components by preschool learners. It would be interesting to investigate the long-term learning effects of the game, too. The potential importance of factors such as language aptitude, learning styles, and motivation are essential to investigate. The researchers did not use any autonomy, motivation, and attitude questionnaires in this research; therefore, further research can be carried out on the relationship between learners' motivation, autonomy, and their attitude and the use of songs, flashcards, and digital games for vocabulary learning.

References

Abidin, M., Pour-Mohammadi, M., Singh, K., Azman, R., & Souriyavongsa, T. (2011). The effectiveness of using songs in YouTube to improve vocabulary competence among upper secondary school studies. *Theory and Practice in Language Studies, 1*(11), 1488-1496.

Aghlara, L., & Tamjid, N. H. (2011). The effect of digital games on Iranian children's vocabulary retention in foreign language acquisition. *Procedia - Social and Behavioral Sciences, 29*, 552-560.

Alemi, M. (2010). Educational games as a vehicle to teaching vocabulary. *The Modern Journal of Applied Linguistics, 2*(6), 425-438.

Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on

aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological science*, *12*(5), 353-359.

Ara, S. (2009). Use of songs, rhymes and games in teaching English to young learners in Bangladesh. *Dhaka University Journal of Linguistics*, *2*(3), 161-172.

Aslanabadi, H., & Rasouli, G. (2013). The effect of games on improvement of Iranian EFL vocabulary knowledge in kindergartens. *International Review of Social Sciences and Humanities*, *6*(1), 186-195.

Azabdaftari, B., & Mozaheb, M. A. (2012). Comparing vocabulary learning of EFL learners by using two different strategies: Mobile learning vs. flashcards. *The Eurocall Review*, *20*(2), 47-59.

Bagheri, E., Roohani, A., & Ansari, D. N. (2012). Effect of CALL-based and non-CALL based methods of teaching on L2 vocabulary learning. *Journal of Language Teaching & Research*, *3*(4), 744-752.

Baleghizadeh, S., & Ashoori, A. (2011). The impact of two instructional techniques on EFL learners' vocabulary knowledge: Flash cards versus word lists. *Mextesol Journal*, *35*(2), 1-9.

Basoglu, E. B., & Akdemir, Ö. (2010). A comparison of undergraduate students' English vocabulary learning: Using mobile phones and flash cards. *TOJET: The Turkish Online Journal of Educational Technology*, *9*(3), 1-7.

Batista, J. S. (2010). Music and song: a learning tool. *Diálogos Pertinentes*, *4*(4), 155-178.

Beck, I. L., & McKeown, M. G. (2007). Increasing young low-income children's oral vocabulary repertoires through rich and focused instruction. *The Elementary School Journal*, *107*(3), 251-271.

Boothe, D., & West, J. (2015). English language learning through music and song lyrics–The performance of a lifetime. In Pixel (Ed.), *Conference Proceedings: The Future of Education* (pp. 248-253). libreriauniversitaria. it Edizioni.

Burhayani, E. (2013). The effectiveness of teaching vocabulary through songs to the second years students of Ikatan Keluarga KesejahteraanTentara (IKKT) Elementary School West Jakarta. In *2nd International Seminar on Quality and Affordable Education,(ISQAE 2013)* (pp. 69-73).

Burkhardt et al. (2003). *enGauge 21st century skills: Literacy in the digital age*. Naperville, IL: NCREL.

Cameron, L. (2001). *Teaching languages to young learners*. Cambridge: Cambridge University Press.

Carnagey, N. L., Anderson, C. A., & Bushman, B. J. (2007). The effect of video game violence on physiological desensitization to real-life violence. *Journal of experimental social psychology*, *43*(3), 489-496.

Chuang, T. Y., & Chen, W. F. (2007). Effect of digital games on children's cognitive achievement. *Journal of Multimedia*, *2*(5), 27-30.

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental psychology*, *33*(6), 934-945.

Dawson, C. R., Cragg, A., Taylor, C., & Toombs, B. (2007). *Video games: Research to improve understanding of what players enjoy about video games, and to explain their preferences for particular games*. London: British Board of Film Classification.

deHaan, J., Reed, W. M., & Kuwada, K. (2010). The effect of interactivity with a music video game on second language vocabulary recall. *Language Learning & Technology*, *14*(2), 74–94.

Demirel, Ö. (2004). *Yabancı dil öğretimi: dil pasaportu dil biyografisi dil dosyası*. Ankara: Pegem Academy Yayıncılık.

Derakhshan, A., & Khatir, E. D. (2015). The effects of using games on English vocabulary learning. *Journal of Applied Linguistics and Language Research*, *2*(3), 39-47.

Diakou, M. (2013). *Using songs to enhance language learning and skills in the Cypriot primary EFL classroom*. Unpublished doctoral thesis, The Open University, UK.

Dzanic, N. & Pejic, A. (2016). The Effect of Using Songs On Young Learners and Their Motivation for Learning English. *NETSOL: New Trends in Social and Liberal Sciences. 1,* 40-54.

Ellis, R. (1997). *SLA research and language teaching*. Oxford: Oxford University Press.

Ervin, G. L. (1988). Purposeful practice with the four-by-six card: Quick, convenient, and communicative. *Foreign Language Annals*, *21*(4), 337-339.

Falk, M., Band, M., & McLaughlin, T. (2003). The effects of reading racetracks and flashcards on sight word vocabulary of three third grade students with a specific learning disability: A further replication and analysis. *International Journal of Special Education*, *18*(2), 57-61.

Farkas, G., & Beron, K. (2004). The detailed age trajectory of oral vocabulary knowledge: Differences by class and race. *Social Science Research*, *33*(3), 464-497.

Fonseca-Mora, C., Toscano-Fuentes, C., and Wermke, K. (2011). Melodies that help: The relation between language aptitude and musical intelligence. *Anglistik International Journal of English Studies*. *22*(1), 101-118.

Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment, 1*(1), 20-20.

Gee, J. P. (2005). Learning by design: Good video games as learning machines. *E-learning and Digital Media, 2*(1), 5-16.

Gee, J. P. (2007). *Good video games+ good learning*. New York: Peter Lang Publishing Inc.

Gee, J. P. (2012). The old and the new in the new digital literacies. *The Educational Forum. 76*(4), 418-420.

Godwin-Jones, R. (2014). Games in language learning: Opportunities and challenges. *Language Learning & Technology, 18*(2), 9–19.

Griffee, D. (1992). *Songs in action*: *Classroom techniques and resources*. New York: Prentice Hall.

Griffiths, M. (2002). The educational benefits of videogames. *Education and Health, 20*(3), 47-51.

Groot, P. J. (2000). Computer assisted second language vocabulary acquisition. *Language Learning & Technology, 4*(1), 56-76.

Gros, B. (2007). Digital games in education: The design of games-based learning environments. *Journal of research on technology in education, 40*(1), 23-38.

Gunawardhana, L. P. D., & Palaniappan, S. (2015). Psychology of digital games and its effects to its users. *Creative Education, 6*(16), 1726-1732.

Hauge, M. R., & Gentile, D. A. (2003, April). *Video game addiction among adolescents: Associations with academic performance and aggression.* Paper presented at the Society for Research in Child Development Conference, Tampa, FL.

Haugland, S. W. (2000). What role should technology play in young children's learning? Part 2. Early childhood classrooms in the 21st century: Using computers to maximize learning. *Young children, 55*(1), 12-18.

Heron, T. E., Heward, W. L., Cooke, N. L., & Hill, D. S. (1983). Evaluation of a classwide peer tutoring system: First graders teach each other sight words. *Education and Treatment of Children, 6*(2), 137-152.

Hirschel, R., & Fritz, E. (2013). Learning vocabulary: CALL program versus vocabulary notebook. *System, 41*(3), 639-653.

Hoff, E. (2009). Language development at an early age: Learning mechanisms and outcomes from birth to five years. In S. Rvachew (Ed) *Language development and literacy*, (pp.7-10).

Houten, R., & Rolider, A. (1989). An analysis of several variables influencing the efficacy of flash card instruction. *Journal of Applied Behavior Analysis, 22*(1), 111-118.

Hunt, A., & Beglar, D. (2002). Current research and practice in teaching vocabulary. In J.C. Richards & W. A. Renandya (Eds.), *Methodology in language teaching: An anthology of current practice* (pp. 258-266). Cambridge: Cambridge University Press.

Huyen, N. T. T., & Nga, K. T. T. (2003). Learning vocabulary through games. *Asian EFL Journal, 5*(4), 90-105.

Ilomäki, L. & Kankaanranta, M. (2009). The ICT competence of the young. In L. Tan Wee Hin, & R. Subramaniam (Eds.), *Handbook of research on new media literacy at the K-12 level: Issues and challenges (pp.* 101-118). Hershey, USA: IGI Global.

Jafarian, R. B., & Shoari, E. (2017). The effect of games on Iranian young EFL learners' vocabulary learning. *European Journal of English Language and Literature Studies, 5*(5), 12-24.

Johnstone, R. M. (2002). *Addressing'the age factor': some implications for languages policy*. Strasbourg: Council of Europe

Jung, J., & Graf, S. (2008). *An approach for personalized web-based vocabulary learning through word association games.* Paper presented at the International Symposium on Applications and the Internet. Turku, Finland.

Kalaycioğlu, H. E. (2011). *The effect of picture vocabulary games and gender on four year-old children's English vocabulary performance: An experimental investigation* (Unpublished master's thesis*).* Middle East Technical University, Turkey.

Keskin, F. (2011). Using songs as audio materials in teaching Turkish as a foreign language. *TOJET: The Turkish Online Journal of Educational Technology, 10*(4), 378-383.

Leemkuil, H. (2006). *Is it all in the game? Learner support in an educational knowledge management simulation game.* (Unpublished doctoral dissertation). University of Twente, The Netherlands.

Liu, C.-C., Cheng, Y.-B., & Huang, C.-W. (2011). The effect of simulation games on the learning of computational problem solving. *Computers & Education, 57*(3), 1907-1918.

Lo, R. & Li, H.C. (1998). Songs enhance learner involvement. *English Teaching Forum, 36*(21), 8-11.

Lui, S. (2015). Use of gamification in vocabulary learning: A case study in macau. *CELC Symposium, 15*(1), 90-97.

Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design*. Mahwah, N.J: Routledge.

Maheady, L., & Sainato, D. M. (1985). The effects of peer tutoring upon the social status and social interaction patterns of high and low status elementary school students.

Education and Treatment of Children,*8*(1), 51-65.

Man-Ki, M., Jahng, S.-G., & Tae-Yong, K. (2011). A computer-assisted learning model based on the digital game exponential reward system. *TOJET: The Turkish Online Journal of Educational Technology*, *10*(1), 1-14.

Mazaji, B. (2015). Effects of digital games on vocabulary acquisition of Iranian low proficiency male and female EFL learners. *International Journal of Foreign Language Teaching and Research, 3(10),* 83-92.

Mejzini, M. (2016). Teaching children through songs, chants and rhymes. *European Journal of English Language Teaching1*(2),104-113.

Millington, N. T. (2011). Using songs effectively to teach English to young learners. *Language Education in Asia*, *2*(1), 134-141.

Mondria, J.-A., & Mondria-De Vries, S. (1994). Efficiently memorizing words with the help of word cards and "hand computer": Theory and applications. *System*, *22*(1), 47-57.

Murphey, T. (1992). *Music and song*. Oxford: Oxford University Press.

Nakata, T. (2008). English vocabulary learning with word lists, word cards and computers: Implications from cognitive psychology research for optimal spaced learning. *ReCALL*, *20*(1), 3-20.

Nation, I.S.P. (1990). *Teaching and learning vocabulary*. Boston, Mass.: Heinle & Heinle Publishers.

Nation, I. S. P. (2013). *Teaching & learning vocabulary*. Boston: Heinle Cengage Learning.

Nation, I. S. (2001). *Learning vocabulary in another language Google eBook*. Cambridge: Cambridge University Press.

Nation, P. (2001). Using small corpora to investigate learner needs: Two vocabulary research tools. In Ghadessy, M., Henry, A., & Roseberry, R. L. (Eds), *Small corpus studies and ELT: Theory and practice*, (pp. 31-45). Amesterdam, Philadelphia: John Benjamins Publishing.

Neuman, S. B., & Wright, T. S. (2014). The magic of words: Teaching vocabulary in the early childhood classroom. *American Educator*, *38*(2), 4-13.

Nicholson, T. (1998). The flashcard strikes back. *The Reading Teacher, 52*(2), 188-192.

Nugroho, Y. S., Nurkamto, J., & Sulistyowati, H. (2012). Improving students' vocabulary mastering using flashcards. *English Education, 1*(1), 1-15.

Nunan, D. (1992). *Research methods in language learning*. Cambridge: Cambridge University Press.

Olenick, D. L., & Pear, J. J. (1980). Differential reinforcement of correct responses to probes and prompts in picture-name training with severly retarded children. *Journal of Applied Behavior Analysis*, *13*(1), 77-89.

Oxford, R., & Crookall, D. (1990). Vocabulary learning: A critical analysis of techniques. *TESL Canada Journal*, *7*(2), 09-30.

Palka, E. (1988) *Using cards to revise and practice language items*, ERIC Document Reproduction Service No. ED 302093.

Pikulski, J., & Templeton, S. (2004). *Teaching and developing vocabulary: Key to long-term reading success*. Boston, MA: Houghton Mifflin Company.

Pomerantz, A., & Bell, N. D. (2007). Learning to play, playing to learn: FL learners as multicompetent language users. *Applied Linguistics*, *28*(4), 556-578.

Prensky, M. (2001). The digital game-based learning revolution. *Digital game-based learning* (pp.1-19). New York: McGraw-Hill.

Prensky, M. (2002). The motivation of gameplay: The real twenty-first century learning revolution. *On the horizon*, *10*(1), 5-11.

Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment (CIE)*, *1*(1), 21-21.

Printz, K., McLaughlin, T., & Band, M. (2006). The effects of reading racetracks and flashcards on sight word vocabulary: A case report and replication. *International Journal of Special Education*, *21*(1), 103-108.

Reinders, H., & Wattana, S. (2014). Can I say something? The effects of digital game play on willingness to communicate. *Language Learning & Technology*, *18*(2) 101–123.

Richards, J. C., & Renandya, W. A. (2002). *Methodology in language teaching: An anthology of current practice.* Cambridge: Cambridge university press.

Rusmiati, R., & Dewi, S. R. (2016). Teaching listening by using English pop song. *Getsempena English Education Journal*, *2*(1), 93-107.

Sánchez, J., & Olivares, R. (2011). Problem solving and collaboration using mobile serious games. *Computers & Education*, *57*(3), 1943-1952.

Schmitt, N. (2010). *Researching vocabulary: A vocabulary research manual*. Basingstoke, England: Palgrave Macmillan.

Schmitt, N., & Schmitt, D. (1995). Vocabulary notebooks: Theoretical underpinnings and practical suggestions. *ELT journal*, *49*(2), 133-143.

Segal-Drori, O., Korat, O., Shamir, A., & Klein, P. S. (2010). Reading electronic and printed books with and without adult instruction: Effects on emergent reading. *Reading and Writing*, *23*(8), 913-930.

Shahriarpour, N. & Kafi, Z. (2014). On the effect of playing digital games on Iranian

intermediate efl learners' motivation toward learning English vocabularies. *Procedia-Social and Behavioral Sciences, 98*, 1738-1743.

Shen, Z. (2009). The roles of depth and breadth of vocabulary knowledge in EFL reading performance. *Asian Social Science, 4*(12), 135.

Stutz, H. (1992). Flashcards: Fast and fun. *Hispania, 75*(5), 1323-1325.

Subrahmanyam, K., Kraut, R. E., Greenfield, P. M., & Gross, E. F. (2000). The impact of home computer use on children's activities and development. *The future of children, 10*(2), 123-144.

Sánchez, J., & Olivares, R. (2011). Problem solving and collaboration using mobile serious games. *Computers & Education, 57*(3), 1943-1952.

Takeuchi, L. M., & Vaala, S. (2014). *Level up learning: A national survey on teaching with digital games*. New York: The Joan Ganz Cooney Center at Sesame Workshop.

Tan, A., & Nicholson, T. (1997). Flashcards revisited: Training poor readers to read words faster improves their comprehension of text. *Journal of Educational Psychology, 89*(2), 276-288.

Tang, S., Hanneghan, M., & El Rhalibi, A. (2009). Introduction to games-based learning. In Connolly, T., Stansfield, M., Boyle, L. (Eds.), *Games based learning advancements for multi-sensory human computer interfaces* (pp. 1–17). Hershey, New York: Information Science Reference (An imprint of IGI Global).

Tsai, F.-H., Yu, K.-C., & Hsiao, H.-S. (2012). Exploring the factors influencing learning effectiveness in digital game-based learning. *Educational Technology & Society, 15*(3), 240-250.

Tuan, L. T. (2011). An Empirical Research on Self-learning Vocabulary. *Theory & Practice in Language Studies, 1*(12), 1688-1695.

Turgut, Y., & İrgin, P. (2009). Young learners' language learning via computer games. *Procedia - Social and Behavioral Sciences, 1*(1), 760-764.

Tüzün, H., Yılmaz-Soylu, M., Karakuş, T., İnal, Y., & Kızılkaya, G. (2009). The effects of computer games on primary school students' achievement and motivation in geography learning. *Computers & Education, 52*(1), 68-77.

Uzun, L. (2009). An evaluative checklist for computer games used for foreign language vocabulary learning and practice: Vocaword sample. *Novitas-Royal, 3*(1), 45-59.

Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE review, 41*(2), 1-16.

Wang, C. K. J., Khoo, A., Liu, W. C., & Divaharan, S. (2008). Passion and intrinsic motivation in digital gaming. *CyberPsychology & Behavior, 11*(1), 39-45.

Yamami, Y. (2016). Student response to singing in speaking class. Bulletin of Faculty of Contemporary International Studies, Nagoya University of Foreign Studies, (12), 185-193.

Young, C. C., Hecimovic, A., & Salzberg, C. L. (1983). Tutor-tutee behavior of disadvantaged kindergarten children during peer teaching. *Education and Treatment of Children, 6*(2),123-135.

Young, D. J. (1991). Creating a low-anxiety classroom environment: What does language anxiety research suggest? *The modern language journal, 75*(4), 426-437.

Young, S. S. C., & Wang, Y.-H. (2014). The Game embedded call system to facilitate English vocabulary acquisition and pronunciation. *Journal of Educational Technology & Society, 17*(3), 239-251.